Remarks

The Office Action dated June 13, 2002 has been carefully reviewed and the foregoing amendment has been made in consequence thereof.

Claims 1-16 are pending in this application. Claims 1-4, 6-12, and 14-16 stand rejected. Claims 5 and 13 are withdrawn from consideration.

Submitted herewith is a Submission Of Marked Up Claims in accordance with 37 C.F.R. § 1.121(c)(1)(ii).

The rejection of Claims 1-16 under 35 U.S.C. § 112, first paragraph is respectfully traversed.

Applicant respectfully submits that the specification of the present application provides adequate description to enable one skilled in the art to make and use the invention. Particularly, the specification describes, at page 6, line 6 through page 7, line 2, and shows in Figure 2 how the large control rods are arranged in an F-lattice configuration. Specifically, the specification describes that an F-lattice configuration has large control rods arranged in staggered rows with sixteen conventional fuel bundles surrounding each large control rod. Further, Applicant submits that a reactor core F-lattice configuration is known in the art. Particularly, U.S. Patent No. 6,097,779 shows in Figure 3, describes in Col. 5, lines 46-61 and Col. 8, lines 56-65, and claims in independent Claims 1, 6, and 9, a reactor core F-lattice configuration.

Applicant also submits that the specification describes, at page 3, lines 1-8, that a large control rod is about two times the width of a conventional control rod and includes four control rod blades extending radially from a central portion and arranged at right angles to each other. Further, Applicant submits that large control rods used in reactor core F-lattice configurations are

known in the art. Particularly, U.S. Patent No. 6,097,779 describes in Col. 5, lines 46-61 that a reactor core F-lattice configuration includes large control rods arranged in a staggered configuration and that fuel bundle receiving channels are formed by control rod blades of adjacent large control rods. Also, the '789 patent describes that four standard size fuel bundles are positioned in each receiving channel. Accordingly, Applicant submits that the subject matter contained in Claims 1-16 is adequately described in the specification to enable one skilled in the art to make and use the invention.

For the reasons set forth above, Applicant respectfully requests that the Section 112, first paragraph, rejection of Claims 1-16 be withdrawn.

The rejection of Claims 1-16 under 35 U.S.C. § 112, second paragraph is respectfully traversed.

As explained above, the specification describes and shows in Figure 3 the meaning of "arranged in staggered rows". Applicant submits that "arranged in staggered rows" is not vague and indefinite. Particularly, large control rods arranged in staggered rows are known in the art, see U.S. Patent No. 6,097,779.

Also, as explained above, the specification describes that a large control rod is about two times the width of a conventional control rod and includes four control rod blades extending radially from a central portion and arranged at right angles to each other. Further, Applicant submits that large control rods used in reactor core F-lattice configurations are known in the art, see U.S. Patent No. 6,097,779.

Further, Claims 1 and 9 have been amended to recite "a coolant flow outlet sized to receive the lower tie plate of a fuel bundle". Accordingly, Applicant submits that Claims 1-16

are definite and particularly point out and distinctly claim the subject matter which Applicant regards as his invention.

For the reasons set forth above, Applicant respectfully requests that the Section 112, second paragraph, rejection of Claims 1-16 be withdrawn.

The rejection of Claims 1-4, 6, 9-12, and 14 under 35 U.S.C. § 102(b) as being anticipated by Dalke et al. (U.S. 5,519,746) is respectfully traversed.

Dalke et al. describe a fuel bundle assembly for a boiling water nuclear reactor (see Figures 4 and 5) that includes an open ended tubular channel subdivided into four quadrants by at least two interior partitions, each quadrant having a sub-fuel bundle assembly having a plurality of fuel rods extending between upper and lower tie plates. An inter-bundle support plate 40 receives a lower end of the channel and has four flow openings 54 at an upper end thereof. The lower tie plate 50 of each sub-fuel bundle is supported in a respective one of the openings 54 in the inter-bundle support plate 40. A single inlet opening 62 is located in the inter-bundle support plate 40. The four flow openings 54 are offset relative to the centerline of inlet opening 62. The sub-fuel bundles within a channel are separated by a cruciform shaped coolant passage. Inter-bundle support plate 40 is supported on a cup 42 fixed to the core plate P.

Claim 1 of the present application recites a core plate assembly that includes a flat plate and a plurality of support beams with the flat plate positioned on top of the support beams. The assembly also includes a plurality of fuel supports extending through the flat plate. Each fuel support includes a coolant flow inlet, a coolant flow outlet sized to receive the lower tie plate of a fuel bundle, and a coolant flow bore extending between the coolant flow inlet and the coolant

flow outlet. The coolant flow inlet is offset from the coolant flow outlet so that a centerline of the coolant flow inlet is parallel to a centerline of the coolant flow outlet.

Applicant submits that Dalke et al. do not describe nor suggest a core plate assembly as recited in Claim 1. Particularly, Dalke et al. do not describe nor suggest a plurality of fuel supports extending through the flat core plate with each fuel support including a coolant flow inlet, a coolant flow outlet sized to receive the lower tie plate of a fuel bundle, and a coolant flow bore extending between the coolant flow inlet and the coolant flow outlet such that the coolant flow inlet is offset from the coolant flow outlet. Rather, Dalke et al. describe a fuel assembly that is supported by a cup attached to the core plate. The cup has a coolant flow inlet, a coolant flow outlet, and a coolant flow bore extending between the coolant flow inlet and the coolant flow outlet. However, the coolant flow inlet and the coolant flow outlet are not offset from each other. Dalke et al. describe an inter-bundle support plate that includes a single inlet and four flow outlets that are offset from the inlet. But, Dalke et al. does not describe nor suggest that the inter-bundle support plate extends through the core plate. Rather, Dalke et al. describe that the inter-bundle support plate is supported by the cup (see Figures 4 and 5, and Col. 4, lines 44-55). Also, as shown in Figure 3, it appears that the inter-bundle support plate is part of the fuel assembly and not part of the core plate assembly.

Further, Dalke et al. do not describe nor suggest a plurality of support beams with the flat core plate positioned on top of the support beams. Accordingly, Applicant submits that Claim 1 is patentable over Dalke et al.

Claims 2-4 and 6 depend from independent Claim 1. When the recitations of dependent Claims 2-4 and 6 are considered in combination with the recitations of Claim 1, Applicant respectfully submits that Claims 2-4 and 6 likewise are patentable over Dalke et al.

Claim 9 of the present application recites a core for a nuclear reactor that includes a core plate assembly that includes a flat plate and a plurality of support beams with the flat plate positioned on top of the support beams. The assembly also includes a plurality of fuel supports extending through the flat plate. Each fuel support includes a coolant flow inlet, a coolant flow outlet sized to receive the lower tie plate of a fuel bundle, and a coolant flow bore extending between the coolant flow inlet and the coolant flow outlet. The coolant flow inlet is offset from the coolant flow outlet so that a centerline of the coolant flow inlet is parallel to a centerline of the coolant flow outlet.

Applicant submits that Dalke et al. do not describe nor suggest a core plate assembly as recited in Claim 9. Particularly, Dalke et al. do not describe nor suggest a plurality of fuel supports extending through the flat core plate with each fuel support including a coolant flow inlet, a coolant flow outlet sized to receive the lower tie plate of a fuel bundle, and a coolant flow bore extending between the coolant flow inlet and the coolant flow outlet such that the coolant flow inlet is offset from the coolant flow outlet. Rather, Dalke et al. describe a fuel assembly that is supported by a cup attached to the core plate. The cup has a coolant flow inlet, a coolant flow outlet, and a coolant flow bore extending between the coolant flow inlet and the coolant flow outlet. However, the coolant flow inlet and the coolant flow outlet are not offset from each other. Dalke et al. describe an inter-bundle support plate that includes a single inlet and four flow outlets that are offset from the inlet. But, Dalke et al. does not describe nor suggest that the

inter-bundle support plate extends through the core plate. Rather, Dalke et al. describe that the inter-bundle support plate is supported by the cup (see Figures 4 and 5, and Col. 4, lines 44-55). Also, as shown in Figure 3, it appears that the inter-bundle support plate is part of the fuel assembly and not part of the core plate assembly.

Further, Dalke et al. do not describe nor suggest a plurality of support beams with the flat core plate positioned on top of the support beams. Accordingly, Applicant submits that Claim 9 is patentable over Dalke et al.

Claims 10-12 and 14 depend from independent Claim 9. When the recitations of dependent Claims 10-12 and 14 are considered in combination with the recitations of Claim 9, Applicant respectfully submits that Claims 10-12 and 14 likewise are patentable over Dalke et al.

For the reasons set forth above, Applicants respectfully request that the Section 102(b) rejection of Claims 1-4, 6, 9-12, and 14 be withdrawn.

The rejection of Claims 7, 8, 15, and 16 under 35 U.S.C. § 103(a) as being unpatentable over Dalke et al. in view of Hirukawa (U.S. 5,267,286) is respectfully traversed.

As explained above Dalke et al. do not describe nor suggest a core plate assembly as recited in Claim 1 nor a core for a nuclear reactor as recited in Claim 9. Accordingly, independent Claims 1 and 9 are patentable over Dalke et al.

Hirukawa describe a fuel assembly having a water cross or water rod arranged between the fuel rods, an inside of the water cross or water rod being divided into a coolant rising passage and a coolant lowering passage, and a control guide tube disposed inside the water cross or water rod and extending along an axial direction of the water cross or water rod. The coolant rising passage has a coolant inlet port formed to a portion above or under a portion at which the fuel

rods are supported by the lower tie plate. The control element guide tube has a coolant outlet port formed at that portion so that a coolant introduced into the coolant rising passage flows vertically upwardly, then turns and flows downwardly along the control element guide tube, and flows into an inside thereof through the coolant outlet port.

Hirukawa does not describe nor suggest a plurality of fuel supports extending through the flat core plate with each fuel support including a coolant flow inlet, a coolant flow outlet sized to receive the lower tie plate of a fuel bundle, and a coolant flow bore extending between the coolant flow inlet and the coolant flow outlet such that the coolant flow inlet is offset from the coolant flow outlet. Rather, Hirukawa describes fuel assembly nozzle 18 that includes a single inlet and four outlets. Fuel assembly nozzle attach to a fuel support that is inserted into a control rod drive housing.

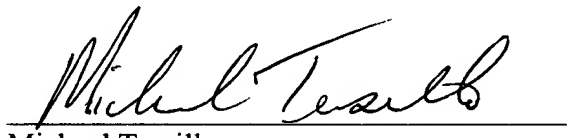
Applicant submits that Dalke et al. and Hirukawa, alone or in combination, do not describe nor suggest a core plate assembly as recited in Claim 1 nor a core for a nuclear reactor as recited in Claim 9. Particularly, Dalke et al. and Hirukawa, alone or in combination, do not describe nor suggest a plurality of fuel supports extending through the flat core plate with each fuel support including a coolant flow inlet, a coolant flow outlet sized to receive the lower tie plate of a fuel bundle, and a coolant flow bore extending between the coolant flow inlet and the coolant flow outlet such that the coolant flow inlet is offset from the coolant flow outlet. Further, Dalke et al. and Hirukawa, alone or in combination, do not describe nor suggest a plurality of support beams with the flat core plate positioned on top of the support beams. Accordingly, Applicant submits that Claims 1 and 9 is patentable over Dalke et al. and Hirukawa, alone or in combination.

Claims 7 and 8 depend from independent Claim 1 and Claims 15 and 16 depend from independent Claim 9. When the recitations of Claims 7 and 8 and Claims 15 and 16 are considered in combination with the recitations of Claims 1 and 9 respectively, Applicant respectfully submits that Claims 7, 8, 15, and 16 likewise are patentable over Dalke et al. and Hirukawa, alone or in combination.

For the reasons set forth above, Applicants respectfully request that the Section 103(a) rejection of Claims 7, 8, 15, and 16 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Favorable action is respectfully solicited.

Respectfully submitted,



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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Chalberg	:	
	:	Art Unit: 3641
Serial No.: 09/692,135	:	
	:	Examiner: J. Richardson
Filed: October 19, 2000	:	
	:	
For: CORE SUPPORT FOR AN F-LATTICE CORE OF A BOILING WATER NUCLEAR REACTOR	:	

SUBMISSION OF MARKED UP CLAIMS

Hon. Commissioner for Patents
Washington, D.C. 20231

A marked-up version of amended Claims 1 and 9, in accordance with 37 C.F.R. § 1.121(c)(1)(ii), follows below.

MARKED UP CLAIMS

1. (amended) A core plate assembly for a nuclear reactor, the reactor comprising a plurality of large control rods, a plurality of cruciform shaped control rod guide tubes, and a plurality of fuel bundles having lower tie plates, said core plate assembly comprising:

a flat plate;

a plurality of support beams, said flat plate positioned on top of said support beams;

a plurality of control rod guide tube openings, each said guide tube opening sized to receive a control rod guide tube, said control rod guide tube openings arranged in staggered rows; and

a plurality of fuel supports extending through said flat plate, each said fuel support comprising:

a coolant flow inlet;

a coolant flow outlet sized to receive [a] the lower tie plate of a fuel bundle; and

a coolant flow bore extending between said coolant flow inlet and said coolant flow outlet, said coolant flow inlet offset from said coolant flow outlet so that a centerline of said coolant flow inlet is parallel to a centerline of said coolant flow outlet.

9. (amended) A core for a nuclear reactor comprising:

a plurality of fuel bundles, each fuel bundle comprising a lower tie plate;

a plurality of cruciform shaped large control rods;

a plurality of cruciform shaped control rod guide tubes; and

a core plate assembly comprising:

a flat plate;

a plurality of support beams, said flat plate positioned on top of said support beams;

a plurality of control rod guide tube openings, each said guide tube opening sized to receive a control rod guide tube, said control rod guide tube openings arranged in staggered rows; and

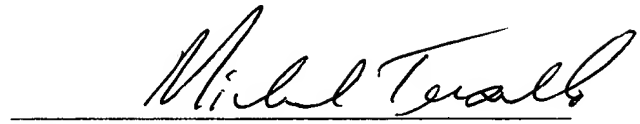
a plurality of fuel supports extending through said flat plate, each said fuel support comprising:

a coolant flow inlet;

a coolant flow outlet sized to receive [a] the lower tie plate of a fuel bundle; and

a coolant flow bore extending between said coolant flow inlet and said coolant flow outlet, said coolant flow inlet offset from said coolant flow outlet so that a centerline of said coolant flow inlet is parallel to a centerline of said coolant flow outlet.

Respectfully submitted,



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